

## RETRACTABLE SELF ROLLING BLIND, AWNING OR COVER APPARATUS

### FIELD OF THE INVENTION

This invention relates to self-rolling apparatus based on a conventional spring mechanism for items such as blinds, awnings and covers. However, the invention should not be construed as being limited thereto and any similar arrangement whereby the invention maybe suitably adapted is meant to be encompassed including advertising signs and the like.

### BACKGROUND TO THE INVENTION

Conventional spring blinds are provided with a so-called hollow keyway tube onto which one end of suitable blind fabric or other material is attached, the remainder of the material being wrapped or rolled around the periphery of the tube. A spring mechanism is provided within the hollow tube, which is itself supported between suitable brackets. The blind fabric maybe caused to unroll for any desired length (up to the limit of material rolled on the tube), usually by pulling on it, which causes the tube to rotate about its axis, thereby winding up (ie. further tensioning ) the spring mechanism.

In a conventional, free hanging blind, a locking means is also provided which prevents the spring from unwinding by itself. However upon releasing the spring mechanism, the tube is able to re-roll the unfurled material back onto itself.

Such an arrangement is particularly suitable for vertically hung blinds, although the same principles maybe applied in other situations where a cover (eg. Swimming pool cover) or awning is required to extend over a specific area. However, where the blind or cover is not vertically hung, it will be generally found that the locking to secure the blind against re-rolling means ( usually in the form of pins which act with gravity) is not needed as the blind itself will be preferably held taught by means of some suitable arrangement such as a hook or catch arrangement.

In such situations however, especially in horizontal arrangements such as pool covers or external awnings, there is a limit to the useful span of cover which could be conveniently achieved (ie. Considering the length of material which maybe unrolled), requiring larger

spring mechanisms to accommodate greater lengths of material to be extended and rewound. This of course means more difficulty of operation, as it becomes necessary to pull against increasing tension of larger springs over greater lengths of material required to be unrolled. Hence there are no known solutions for covering larger expanses.

### OBJECT OF THE INVENTION

It is therefore an object of the present invention to overcome or at least ameliorate some or all of the foregoing disadvantages by providing an improved retractable rolling apparatus, relying in principle on the use of more than one sheet of material (and especially two sheets) rolled about a keyway tube of an otherwise conventional spring type blind or awning mechanism, each of the sheets extending generally (but not necessarily) in opposite directions, so that in the case of two sheets of material pulled in opposite directions, the span of extended material is effectively doubled for each revolution of the tube, when compared with a single sheet.

In this way, the span covered by a particular size of spring mechanism may itself be effectively doubled. This follows from the fact that the spring is twisted by the rotation of the tube. For a given number of revolutions of the tube, double the coverage will be achieved. It will of course be appreciated that compared with conventional spring blind mechanism in which the keyway tube and spring remains supported between fixed brackets, the keyway tube in the present invention is free to travel as the self rolling apparatus is unwound, the free end of one fabric portion itself being securely anchored or attached (instead of the spring and keyway tube being held in a fixed location as in a conventional arrangement).

It is generally found that with conventional arrangements especially in use as an awning, the sagging, that is the weight and stability of the material extended over a large area is a major problem, in the present invention this problem is greatly reduced due to the traveling of the keyway tube, and the tension of the spring.

### DISCLOSURE OF THE INVENTION

According to the present invention there is provided a retractable self rolling blind, awning or cover apparatus, comprising two or more sheets of fabric or other suitable material affixed and wound conjointly about a keyway tube. The tube being fitted with a conventional spring mechanism or similar for use with blinds, awnings and the like, the spring mechanism being pretensioned so as to causing the sheets of fabric to be rewound about the keyway tube when one or more of the sheets of fabric is released from it's extended or unwound position, and wherein the keyway tube and spring are allowed to travel during unwinding and winding up of the fabric.

The ends (that is the spring mechanism end and the opposite idler end ) which are normally supported between two fixed brackets in a conventional blind, awning arrangement are now provided with wheels or a wheel unit or brackets attached to wheels or a wheel unit, a carriage or alike.

The wheels or wheel unit or alike will be placed in tracks or alike to prevent the spring from losing it's tension. The wheel unit placed in the track will absorb the spring tension and not allow the spring tension to be released, but at the same time allowing the wheels to roll freely, and allow the keyway tube and spring to travel back and forth along the track.

Thus, in one particular embodiment of the invention, where an area is to be covered, such as a pool, pergola or over a glass roof, such wheels and tracks will assist the rolling of the tube, especially by keeping the fabric of the cover above the area to be covered, thereby assisting with the rolling of the tube and it's material. This arrangement provides great stability for the keyway tube and solid support for the material, thereby reducing the sagging of the material. In any event, any such wheels may conveniently be allowed to travel freely in the tracks over the area being covered, the tracks will provide the necessary clearance needed. The type of wheels, the number of wheels and the arrangement of wheels will depend on the particular use to which the apparatus is to be put.

It will also be understood that the position of any such wheels will depend on several factors in the design of the specific unit to be employed. Similarly any suitable roller type arrangement maybe substituted for wheels as such. Although several geometrical arrangements are thus possible, it has been found especially useful to have the wheel unit mounted on to the spring end and idler end where the embodiment functions as an awning or cover.

In a particular embodiment suitable for shade covers and awnings, ie where the whole apparatus is effectively suspended above an area, or even below a ceiling (eg. Glass ceiling), the spring end and the opposite idler end may be provided with wheels, or a wheel unit conveniently arranged to run on guide wires or the like to allow the tube to travel in the direction in which the blind or cover material is to be rolled and unrolled, but restricting lateral movement along the axis of the tube, thereby giving it not only support but stability to the arrangement as a whole.

To assist in this arrangement, the wheel unit or alike will preferably house four pulley type wheels, two wheels at the top to sit and roll on the wire and two wheels below the wire. The wheel unit will retain the tension on the spring but at the same time allow the smooth rolling of the wheels. The wheel unit in this case will encapsulate the wire so that the wheel unit does not come off the wire during the rolling and unrolling of the material.

It will generally be appreciated that in any such arrangement described herein, one end of one sheet of fabric or material will itself be secured in a suitable position for it's intended use, whilst the free end of the other fabric sheet(where two are utilized), will correspond with the free end of the blind material in a conventional single sheet arrangement, thus allowing the spring and keyway tube to move or travel as the rolling apparatus is unrolled and rolled.

To provide more tension and balance to the apparatus, the idler end can be replaced with a reverse spring, so that the keyway tube now has two springs, giving greater force and evenness to the apparatus as it travels, rolling and unrolling the material.

However, whilst these are the preferred arrangements, especially in situations such as for use in swimming pool covers, or general awning arrangements, no such limitation is actually meant in relation to use of the invention as a whole and other arrangements, particularly for certain special awnings and the like, and where more than two sheets are utilized, more than one such end may be held in fixed location as required.

Embodiments of the invention may find practical application as pool covers, ground covers, for shading, as glass room covers, caravan annexes and extensions and so forth. In this regard, one particular embodiment utilizing three sheets of fabric, allows for a pair of sheets to form an awning or effective ceiling, whilst a third sheet may drop down from the central keyway tube to form a wall portion or divider.

It will also be appreciated in situations where the self rolling apparatus is utilized as say a swimming pool cover there are considerable advantages in having the two sheets of material unroll from a common tube since each piece of material maybe conveniently shaped to correspond to that portion of the pool over which it is to be extended.

With advantage, two or more self rolling apparatuses according to the invention may be coupled together to extend the area which maybe covered. In this way, the end of one material panel will be connected by suitable means to the end of another material panel extending in opposite direction from the next adjacent rolling apparatus. This arrangement can also be achieved by having one very long piece of material divided into sections and then locating a number of spring and keyway tube and wheels arrangements at suitable points to allow for the rolling and unrolling of the material as one unit.

When used as a pool cover, the apparatus according to the invention has the advantage of being more fully supported than a simple rolled out tarpaulin or cover. One advantage following from this arrangement is that fallen leaves etc. are more readily kept on the cover (and so prevented from falling into the pool) so that they are transported away from the pool area and may be removed conveniently by a suitable spreader type arrangement and allowed to drop say to the side, during retraction of the mechanism.

One advantage that has been found in utilizing the invention is that the creasing of the fabric as it rolls is markedly reduced where two or more fabric panels are wound up together, as compared with rolling a single panel in a conventional arrangement.

In another embodiment of the invention, an awning in which one horizontal "ceiling" panel is formed from one sheet of material, whilst a second sheet forms a vertical "wall" is envisaged. The keyway tube in this case may conveniently act as the junction of the wall and ceiling portions, being itself a rigid member to further provide stability and integrity to such a structure.

Another embodiment of the invention resides in utilizing the self rolling structure as an extendible vertical panel. In this embodiment the wheels on one end, that is to say the lower end, of the self rolling apparatus will be perpendicular to those utilized in the aforementioned embodiments. The upper and lower wheels may run and be supported in tracks or guides or alike. This embodiment will be useful in large doorways or as vertical screens and temporary walls.

Although the spring mechanism in the majority of cases would be used it may not be the only way to roll and unroll the material, it is possible to introduce an electric motor (as used in awnings and blinds) to replace the spring mechanism but still having the keyway tube traveling as it rolls and unrolls the material. This may suit more rigid type material such as aluminium, similar to the ones used for security shutters, roller shutters and the like.

Another embodiment of the invention for use as a movable or transferable awning is to have temporary locking points located along the length of the tracks or wire allowing the apparatus as a whole unit to be positioned, anchored and extended anywhere along the tracks, for example following the direction of the sun for shading purposes.

Embodiments of the invention may also find practical use as hose reels or retracting electrical cord, as a temporary fruit net, a conveyer and so forth.

## BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the invention are illustrated in the accompanying drawings of which;

Fig. 1 is a perspective view of a rolling apparatus, especially suitable for use as an awning, according to the present invention, in the rolled up or contracted state.

Fig. 1A is a perspective view of an embodiment of the invention for use as an awning showing the spring end attached to the wheel unit inside the track.

Fig. 2 is a perspective view of the rolling apparatus according to fig. 1 but in an unrolled or extended state,

Fig. 3 is a perspective view of a similar arrangement to that shown in fig.1 and fig. 2 for use as a cover, herein shown in the extended position only, except that a different wheel unit is allowed to travel on guide support wires.

Fig. 3A is a perspective view of an embodiment of the invention for use as an awning showing the spring end attached to wheel unit in conjunction with a guide wire.

Fig. 4 is a perspective view of a similar arrangement to that shown in fig. 1 and fig. 2 herein shown in extended form only for use as a roof and wall cover except that the tracks are provided with a curve track section to allow the wheels to roll downwards to create a wall.

Fig. 5 is a front view of an embodiment of the invention for use as an extendable vertical panel, herein shown in extended form only, the panel in this case is being pulled from left to right.

## BEST MODE OF CARRYING OUT THE INVENTION

Referring generally to the drawings and in particular to fig.1 and 2 there is depicted a rolling apparatus, generally referenced 11, comprising a keyway tube 12, having a keyway 13, which runs along the length thereof. The spring mechanism end 14, and idler end 15, located at each end of the keyway tube 12 are fitted with a wheel unit 16, which support the rolling apparatus 11 and allows it to roll in any suitable tracks 22.

Two sheets of cover material 17 are wound about a keyway 12. The inner edges of each sheet of material 17, not visible, are fitted within the keyway slot 13 which runs along the length of the tube 12, in known fashion (except that two sheets rather than one sheet are fitted). The two sheets of material 17 are each provided with a bar member 18 at their free ends to assist in pulling the sheets and generally supporting the free ends thereof. Wheels 20, are fitted to the ends of bar member 18 and then placed into tracks 22. One or more hooks 19 or similar pull facility are also provided in the vicinity of the ends of the sheets of material 17 to further facilitate grasping and pulling, or otherwise retain where appropriate, each sheet of material 17 against a fixed feature such as a wall 27 etc. (not shown). In this case a pull stick 40 is utilized as illustrated on one of the hooks 19, in this case a central one at one free end of material 17, whilst the other end is retained by suitable means (not illustrated).

Bar member 18, on the free end is pulled along by hook 19, this free end is pulled in order to assist in it's travel across the relevant tracks 22, especially where that area is relatively expansive, as this will provide support and ease of use.

Depicted in fig. 3 is an alternate arrangement in which the identical components are referenced with the same reference numerals. In this embodiment however, the wheel unit 16, located in tracks 22, are replaced with an alternate set of wheels unit 16 located instead on guide support wires 23.

In use, the invention as illustrated in either embodiment of Figs. 1 to 3 functions in an identical way. That is to say, in order to unroll the apparatus, it is only necessary to grasp and pull on one end of one sheet of material, whilst the end of the other sheet of material is prevented from moving by any suitable means. As the first sheet is pulled, it causes the rolling apparatus to unwind allowing the apparatus itself to move in the direction in which the first sheet is being pulled. The apparatus is assisted in it's travel by rolling on the wheels provided. Due to the geometry of the arrangement, the apparatus (keyway tube and spring) will travel one half of the distance spanned by the two sheets of material, that is the effective distance that the end of the first sheet itself will have traveled.



On the other hand it will be understood that the rolling apparatus itself maybe kept stationary and allowed to unroll as both sheets are pulled simultaneously in opposite directions should that arrangement be more desirable in certain situations. In awning arrangements, it will also be appreciated that each free end of material may be secured against movement whilst the rolling apparatus is caused to move tangentially away from the shortest line between the two ends to form for example a wall and ceiling arrangement.

Fig. 4 shows an embodiment suitable for use as an awning and side cover, wherein similar components to those shown in Figs. 1 and 2 are again indicated by the same reference numerals. In this case the bar member 18 on one free end is fixed by suitable means to for example a wall 27, while the other free end is extended forming a roof, the tracks 22 are provided with a curve track section 29, the wheels 16 on the free end travel downwards as the free end is extended further creating a wall.

Referring to Fig. 5 for use as a vertical screen, roll out door or temporary wall panel, again utilizing identical reference numerals for similar parts to those in Fig 1 and 2, there is shown a self rolling apparatus 11, comprising a keyway tube 12. The spring 14 and idler end 15 mounted on to a wheel unit 16, which are placed and roll in tracks 22. One free end is attached to a wall 27, by suitable means as the other free end with bar member 18 is extended horizontally, in this case left to right to enclose a doorway for example. The wheels 16 travel in a track 22 placed along the ground and in the opposite track 22 above it, the apparatus in this case is sitting vertically and is allowed to travel back and forth.

The foregoing describes only some embodiments of the present invention, and modifications to those skilled in the art can be made thereto without departing from the scope of the present invention.